

REMARKS

The applicant appreciates the Examiner's thorough examination of the application and requests reexamination and reconsideration of the preceding amendments and the following remarks.

The applicant acknowledges and appreciates the Examiner's allowance of claim 1-8, 13, 16 and 17. The applicant also acknowledges and appreciates the Examiner's indication that claims 10 and 12 would be allowable if rewritten in independent form including all of the elements of the base claim and intervening claims. The applicant notes that the combination of claims 9 and 10 includes elements of the applicant's allowed claim 1. New claim 20 includes the elements of claims 9 and 12. Accordingly, new claim 20 is also in condition for allowance.

The Examiner rejects claims 9 and 11 under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,917,388 to *Tronche et al.* The Examiner states in pertinent part that a circuit 21 is located on the upper ground plane 21c and "inherently includes" a connecting contact on the top surface of the circuit, and that the Examiner "considers" the end of the transmission line (211a or 201a) closest to the circuit to be the bonding end of the transmission line and the end furthest from the circuit to be the transitioning end.

It is clear from Figs. 1-4 of *Tronche et al.* that the transmission lines 211a and 201a and the chip 21 do not include pads, in contrast to the applicant's claim 9. See e.g. bonding pad 42 and transition pad 46 on either end of transmission line 44, and die pad 40 as shown in the applicant's Fig. 9, for example, and compare Fig. 4 of *Tronche et al.* which does not disclose the applicant's claimed pads at all.

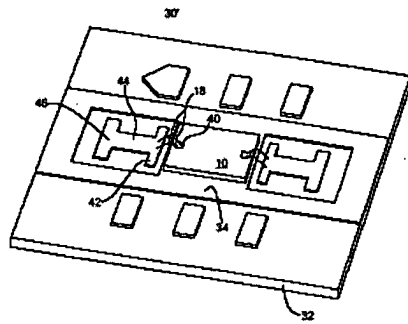


FIG. 9

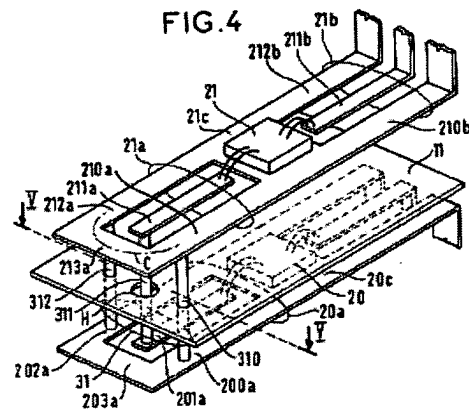


FIG. 4

Thus, in contrast to the applicant's claim 9, the transmission lines 211a and 201a and the chip 21 disclosed by *Tronche et al.* do not include the pads claimed by the applicant.

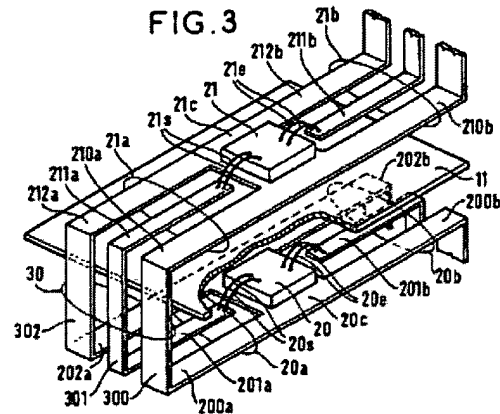
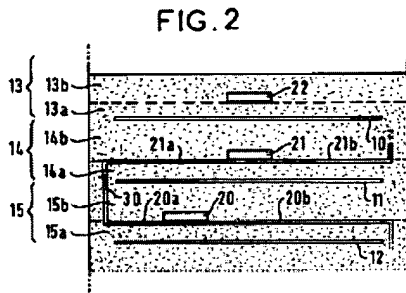
The applicant's claimed bonding pad and die pad serve as one basis for the formation of capacitances which compensate for the inductance of the wire bonds. See e.g. the applicant's specification at page 10, lines 11-17. *Tronche et al.* does not disclose the structure of the applicant's claim 9.

Accordingly, the applicant traverses the Examiner's assessment that these features claimed by the applicant are disclosed in *Tronche et al.* inherently, or that these features can be considered part of *Tronche et al.*'s disclosure.

Even assuming *arguendo* that transmission line 211a is considered to include a bonding pad, *Tronche et al.* discloses that the transmission line 211a is not co-planar with any of the ground planes 10, 11 or 12.

This is clear from Fig. 4 of *Tronche et al.* reproduced above, which shows that transmission line 211a is not co-planar with ground plane 11.

It is further clear from Figs. 2 and 3 of *Tronche et al.* reproduced below, which show that input line 21a -- which includes transmission line 211a -- is not co-planar with any of the ground planes 10, 11 or 12.



Thus, *Tronche et al.* is also in contrast to the applicant's new claim 21, which recites the pads of claim 9, and that the bonding pad on the upper surface of the substrate are co-planar with the upper ground plane.

Further, *Tronche et al.* does not disclose that the bonding pad wider than the first transmission line, in contrast to new claim 22.

It is clear therefore, that *Tronche et al.* does not disclose each and every element of the applicant's independent claim 9 or new claims 21 and 22. Accordingly, claims 9, 21 and 22 are in condition for allowance. Claims 10-12 depend directly or indirectly from claim 9, and thus are also in condition for allowance for at least the reasons above.

The Examiner also rejects claims 14 and 15 under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 6,873,230 to *Shirasaki*, stating in pertinent part that the

Examiner “considers” the end of the transmission line not surrounded by the ground plane to be the bonding end.

Whether or not the Examiner considers the end of the transmission line disclosed by *Shirasaki* to be the bonding end, it is clear that this end is not surrounded by the ground plane. This is in sharp contrast to the applicant’s claim 14, which specifically recites that the upper surface ground plane surrounds the bonding pad and the first transmission line. See e.g. the embodiment shown in the applicant’s Fig. 9 (showing upper surface or top ground plane 34 surrounding bonding pad 42, transmission line 44 and transition pad 46) as compared to *Shirasaki* Figs. 1 and 2 (showing that ground conductor 6 is not surrounding conductor 3):

FIG. 1

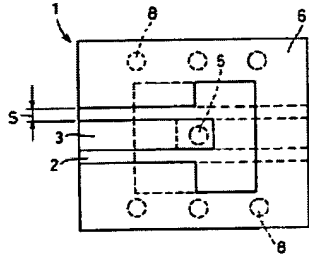


FIG. 2

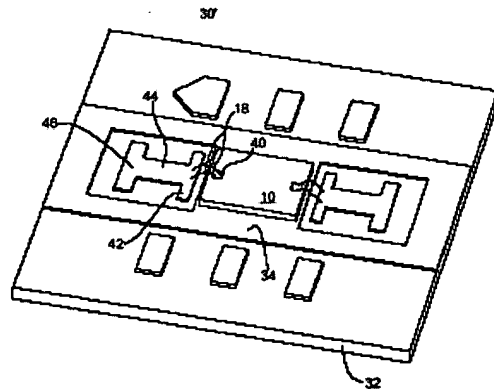
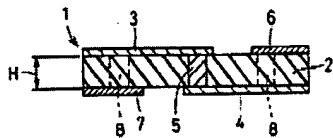


FIG. 9

In order to find anticipation, not only must all of the elements the claim be found within a single prior art reference, but “[t]here must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the art.”

See e.g. Scripps Clinic v. Genentech, Inc., 927 F.2d 1565, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

Line conductor 3 disclosed by *Shirasaki* is not surrounded by ground conductor 6 (and, the applicant notes, line conductor 4 is not surrounded by ground conductor 7). A person of ordinary skill in the art would view a difference between the applicant's claim 14 where the bonding pad and transmission line are surrounded by the upper surface ground plane, and *Shirasaki*'s disclosure where the line conductor 3 is not surrounded by the ground conductor 6, even if the portion that is not surrounded by the ground plane is considered the bonding end.

Accordingly, claim 14 is not anticipated by *Shirasaki*, and it is in condition for allowance.

Claim 15 as amended includes an upper surface ground plane electrically connected to a lower surface ground plane, a transmission path, and further recites in pertinent part: "... a portion of the upper surface ground plane and the lower surface ground plane defining structure on either side of the transmission path for signal isolation, including a portion of the upper surface ground plane surrounding the bonding pad and the first transmission line...".

As noted above in the discussion relating to claim 14, *Shirasaki* fails to disclose that either of the line conductors 3 or 4 are surrounded by their respective ground conductors 6 and 7. The applicant's claim 15 recites, among other things, that a portion of the upper surface ground plane surrounds the bonding pad and the first transmission line. Thus, *Shirasaki* also fails to disclose each and every element of the applicant's claim 15.

Accordingly, claim 15 is also in condition for allowance.

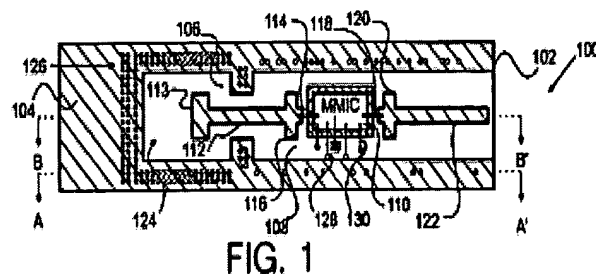
The Examiner further rejects claims 18 and 19 under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,982,250 to *Hung et al.* The Examiner states in pertinent part that *Hung et al.* discloses a package with a MMIC located on a ground structure, and in the rejection the Examiner calls element 104 the ground structure.

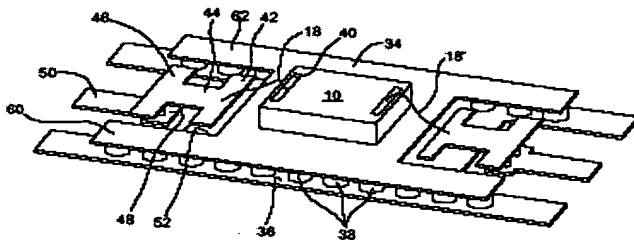
The applicant's claim 18 recites a die located on a ground structure. In contrast, *Hung et al.* discloses that the MMIC is not on the "ground structure" 104, as categorized by the Examiner. Instead, *Hung et al.* clearly discloses that the MMIC is on a land region, i.e. land region 108, not region 104. *Hung et al.* states:

The top side 102 [of circuit package 100] is coated in a conductive coating 104, for example, a precious metal. The *conductive coating 104 is selectively patterned to form a land region 106* on the top layer of the package 100. As used in this specification, the term "land region" indicates an area devoid of conductive coating. A second land region 108 and additional land regions (not shown) may also be formed by selective patterning to provide regions in which a ... (MMIC), or other signal processing circuit may be placed.

See *Hung et al.* at column 4, lines 3-12, with emphasis added.

See also *Hung et al.* Fig. 1 showing that the MMIC is not on "ground structure" region (cross-hatched area) 104, and compare it with the applicant's Fig. 5, for example, which shows die 10 on ground plane 34. Both figures are reproduced below.

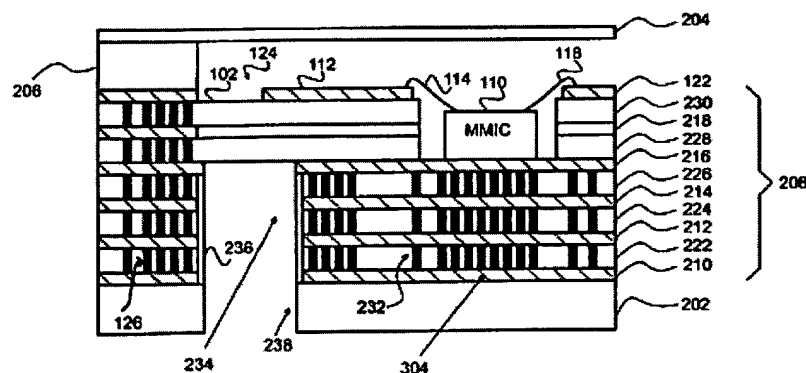




However, the Examiner's categorization of element 104 as a ground plane is not correct. *Hung et al.* does disclose a ground plane, but it is element 216, a conductive layer which may form a ground plane. Conductive layer/ground plane 216 lies beneath bonding pad 116 (which is part of microstrip 112). See *Hung et al.* at column 5, lines 31-37 where it states:

Still with reference to Fig. 3, the microstrip 112 is shown in place on the top side 102 of the dielectric layer 230 ... The conductive layer 216 may form the ground plane for the microstrips 112 and 122.

See also *Hung et al.* Fig. 3 showing the layers beneath microstrip 112, including ground plane 216. Fig. 3 is reproduced below.



In contrast to the applicant's claim 18, it is clear that ground plane 216 does not have opposing members on either side of the transmission path/microstrip 112 because ground plane 216 lies well beneath transmission path/microstrip 112.

In summary, *Hung et al.* discloses that MMIC 110 is not on element 104, but is instead is on a land region, i.e. region 108, in contrast to the applicant's claim 18. However, element 104 is a conductive coating, not a ground structure, and *Hung et al.* discloses that ground plane 216 is beneath the transmission path. The ground plane 216 thus does not have opposing members on either side of the transmission path, in contrast to the applicant's claim 18.

For the foregoing reasons, *Hung et al.* does not disclose each and every element of the applicant's claim 18, and does not anticipate the applicant's claim 18. Accordingly, claim 18 is in condition for allowance.

With respect to claim 19, as amended claim 19 recites an interconnect device for use between a bonding pad on a first plane and a die pad on a second plane. The device includes a ground plane co-planar with the first plane and at least one wire extending from the bonding pad to the die pad. The bonding pad is co-planar with the ground plane and connected to a transmission line co-planar therewith. The transmission line is connected to a transition pad co-planar therewith.

In contrast, *Hung et al.* discloses that the ground plane 216 is not co-planar with "bonding pad" 116, which forms part of microstrip 112. This is clear from *Hung et al.* Fig. 3, which is a cross-sectional view of the circuit package shown in Fig. 1. This point is noted *supra* in connection with the discussion of claim 18, and *Hung et al.*'s Fig. 3 is reproduced

above. (Also as noted above, element 104 of *Hung et al.* is a conductive coating.)

Accordingly, claim 19 is also in condition for allowance.

CONCLUSION

Each of the Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that claims 9-12, 14, 15, 18, 19 and new claims 20-22 are in condition for allowance, as well as previously allowed claims 1-8, 13, 16, and 17.

Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

Respectfully submitted,



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